REPLY BRIEF
EXAMINING GROUP 1797
Patent Application
Docket No. GJE.7543

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner	:	Jade R. Chwasz
Art Unit	:	2872
Applicants	:	Jeffrey Blyth *et al.*
Serial No.	:	10/565,094
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For	:	Holographic Sensor

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Commissioner for Patents
P.O. Box 1450
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REPLY TO EXAMINER'S ANSWER

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March 18, 2011

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STATUS OF CLAIMS

Claims 1-19 were finally rejected in the Office Action of June 24, 2010 under 35 U.S.C. §103(a). The rejections of claims 1-19 have been appealed in the Appeal Brief filed November 24, 2010.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-6 and 14-19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Lowe *et al.* (U.S. Patent No. 5,989,923), Stephens *et al.* (GB Patent No. 2054995 A), and Yin *et al.* (U.S. patent No. 5,499,117). Claims 7-13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Lowe *et al.* in view of Stephens *et al.* and Yin *et al.*, as applied to claims 1 and 5, and further in view of Mizutani *et al.* (U.S. Patent No. 6,483,611).

ARGUMENT

This is in response to the Examiner's Answer (hereinafter, "the Answer") dated January 21, 2011.

With regard to Sections (1) through (8) and (11) of the Answer, no areas of disagreement between the Appellants and the Patent Office are evident.

With regard to Section (9) of the Answer, the grounds of rejection are maintained from the Final Rejection. The Appellants have addressed the substance of these grounds of rejection in the Appeal Brief.

With regard to Section (10) of the Answer, in which the Answer responds to the Appellants' arguments, the Appellants note what appear to be new issues.

The Appellants would like to address the following points, including the new issues raised in the Answer's "Response to Argument" section.

A. The Answer asserts that Lowe *et al.* teach holograms that can function as non-planar mirror holograms and that this meets the claimed element of a hologram formed as a non-planar mirror.

The Answer states at page 11 that "a non-planar mirror can be formed by multiple methods" and that the hologram of Lowe *et al.*, "upon interrogation, functions as a non-planar mirror hologram because of how the hologram/curved fringes are reconstructed." Even assuming for the sake of argument that a non-planar mirror hologram can be formed by multiple methods (an assertion with which the Appellants do not necessarily agree), the Appellants maintain that the Lowe *et al.* reference "does not disclose a hologram formed as a non-planar mirror, or suggest that it should be" (paragraph 3 of the Lowe Declaration; emphasis added). The Lowe Declaration does not merely state that Lowe *et al.* fail to teach a hologram formed as a non-planar mirror by the same method as the subject invention; instead, paragraph 3 of the Lowe Declaration states that Lowe *et al.* "[do] not disclose a hologram formed as a non-planar mirror, or suggest that it should be", by any method. In addition to being an inventor on the subject application and being aware of the level of ordinary skill in the art, Dr. Lowe is an inventor on the Lowe *et al.* reference and is plainly qualified to make such a statement about the teachings of the Lowe *et al.* reference.

In addition, even assuming for the sake of argument that the Answer's assertion about the teachings of Lowe *et al.* is correct (though the Appellants maintain that it is not), the combination of cited references still fails to disclose or suggest a hologram formed as a non-planar mirror. The Answer asserts that "the reflection holograms, such as formed by Lowe *et al.* can have fringes that are curved, so that the holograms can function as non-planar mirror holograms" (emphasis added). The Answer also notes that "[t]he claims do not specify that the recording surface of the mirror hologram is formed as a non-planar surface." However, the claims do require that "the hologram is formed as a non-planar mirror" (emphasis added) and do not simply recite that the hologram is configured to function as a non-planar mirror. Thus, even assuming for the sake of argument that the hologram of Lowe *et al.* can function as a non-planar mirror, there is still no teaching or suggestion in Lowe *et al.*, or anywhere in the combination of cited references, of a hologram formed as a non-planar mirror (see, e.g., paragraph 3 of the Lowe Declaration).

As discussed in the Appeal Brief filed November 24, 2010, when determining whether a claim is obvious, an examiner must make "a searching comparison of the claimed invention – *including all its limitations* – with the teaching of the prior art." *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, "obviousness requires a suggestion of all limitations in a claim." *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (*citing In re Royka*, 490 F.2d 981, 985 (CCPA 1974)). In this instance, the combination of cited references fails to teach or suggest the limitation that "the hologram is formed as a non-planar mirror."

B. The Answer asserts that the motivation given to combine Lowe *et al.* and Stephens *et al.* is valid and that the teachings of Stephens *et al.* have not been misinterpreted in the Action of June 24, 2010.

The Answer maintains the position, as previously taken in the Action of June 24, 2010 (hereinafter referred to as "the Action"), that Stephens *et al.* teach guiding light of the narrowest possible bandwidth both to and from a holographic surface. However, a reading of Stephens *et al.* indicates otherwise. Stephens *et al.* actually disclose a source of broadband light which illuminates the hologram. That is, the light guided to the hologram has a wide bandwidth and is in fact disclosed as white light, which encompasses all visible wavelengths (see page 2, lines 67-

68). The hologram reflects light of a narrow bandwidth **from** the holographic reflecting surface **2, 17**. The reflecting surfaces **2, 17** are optically transparent to most of the visible spectrum such that, of the broadband (white) light guided to the reflecting surface, only light lying in a very narrow frequency band is reflected (page 2, lines 75-82). This is even more evident from the presence of the absorbing plates **38**, which are included in Stephens *et al.* behind the reflecting surfaces **2, 17** to absorb the light that passes through the reflecting surfaces **2, 17**. The light absorbed by the absorbing plates **38** will be a majority of the visible spectrum because white light is guided to the reflecting surface **2, 17** and only a small band of visible light is reflected, meaning that the remainder of the visible spectrum not reflected will be absorbed by the absorbing plates **38**.

Thus, the Appellants maintain that there is no teaching or suggestion in Stephens *et al.* of guiding light with the narrowest possible bandwidth to the hologram. The Examiner respectfully notes, on page 12 of the Answer, that "the phrase 'to guide light with the narrowest possible bandwidth' as recited in [the Action] is meant to describe the ability of the optical fibers of Stephens *et al.* to guide light, which has the narrowest possible bandwidth needed, to and from a holographic surface." While the Appellants are grateful for the Examiner's attempt to clarify, there does not appear to be any disagreement on the meaning of the phrase "to guide light with the narrowest possible bandwidth." Instead, the Appellants disagree with the notion that Stephens *et al.* disclose the guiding of light with the narrowest possible bandwidth to the holographic surface. As discussed above and in the Appeal Brief filed November 24, 2010, Stephens *et al.* actually teach guiding light with a wide bandwidth (e.g., white light) to the holographic reflecting surface **2, 17** and reflecting light of a narrow bandwidth from the hologram (see also paragraph 4 of the Lowe Declaration). This is accomplished by configuring the reflecting surfaces **2, 17** to be transparent to most of the visible spectrum and reflective to only a narrow bandwidth of light.

Accordingly, the reason for combining Lowe *et al.* and Stephens *et al.* given in the Answer and in the Action ("...to guide light with the narrowest possible bandwidth to the holographic surface...") is not valid. There is no teaching or suggestion in Stephens *et al.* of guiding light "with the narrowest possible bandwidth" to a holographic surface. Instead, a reason to combine Lowe *et al.* and Stephens *et al.* could only be found with the impermissible use of hindsight.

C. The Answer asserts that, if light with the narrowest possible bandwidth was guided to the surface of a holographic surface, in most cases there would be reflection.

The Answer disagrees with the argument of the Appellants that, if light with the narrowest possible bandwidth was guided to the surface of a holographic sensor, in most cases there would be no reflection. The Answer asserts at page 13 that "Stephens *et al.* specifically disclose that a reflection does occur, even light with a (sic) narrowest possible bandwidth (i.e. the narrowest possible bandwidth needed) to be further guided by optical fibers to a sensor for detection." However, this is a misinterpretation of the teachings of Stephens *et al.*

As discussed above in section B, Stephens *et al.* disclose a source of broadband light which illuminates a hologram. That is, the light guided to the hologram has a wide bandwidth and is in fact disclosed as white light, which encompasses all visible wavelengths (see page 2, lines 67-68). The hologram reflects light of a narrow bandwidth from the holographic reflecting surface **2, 17**. The reflecting surface **2, 17** is configured to be optically transparent to most of the visible spectrum such that, of the broadband light guided to the reflecting surface, only light lying in a very narrow frequency band is reflected (page 2, lines 75-82).

Thus, if it were the case that light of a narrow bandwidth were guided to the reflecting surfaces **2, 17**, there would only be reflection if the narrow bandwidth of the guided light happened to overlap with the narrow bandwidth for which the surface is reflective. Because it is very unlikely that these two narrow bandwidths would overlap, in most cases there would be no reflection at all.

The fact that Stephens *et al.* disclose that light of a narrow bandwidth is reflected from the reflecting surface does not mean that there would be reflection if light having a narrow bandwidth is guided to the surface. Instead, the disclosure in Stephens *et al.* merely implies that when white light (i.e., light having all visible wavelengths) is guided to the surface **2, 17**, light of a narrow bandwidth is reflected.

Accordingly, the Appellants maintain that, if "light with the narrowest possible bandwidth" was guided to the surface of a holographic sensor, in most cases there would be no reflection (see paragraph 5 of the Lowe Declaration). The Appellants note that, even assuming for the sake of argument that Stephens *et al.* do teach guiding narrow band light to the surface of a hologram (which the Appellants maintain is not the case), the reason given in the Answer and

the Action for combining Lowe *et al.* and Stephens *et al.* would thus still be invalid because one of ordinary skill in the art would not consider a reference that teaches directing narrow band light to the surface relevant to use with a holographic sensor of the type described by Lowe *et al.* (see paragraph 5 of the Lowe Declaration). A skilled artisan would certainly not consider the disclosure of Stephens *et al.*, which actually teaches reflecting light of the narrowest possible bandwidth from the surface, relevant to use with a holographic sensor of the type described by Lowe *et al.*

D. The Answer asserts that the conclusion of obviousness is not based on hindsight reasoning.

The Answer asserts at page 13 that "a person having ordinary skill in the art would have been motivated to modify the device of Lowe *et al.*, in view of Stephens *et al.*, so that light can be guided with a very narrowband width (sic) to the holographic surface so that the colors reflected are indicative of the part of the reflector from which it is received. The Appellants respectfully disagree.

As discussed above in section B, Stephens *et al.* actually teach guiding light with a very wide bandwidth to a hologram and reflecting light of a narrow bandwidth **from** a hologram. In addition, as discussed herein in section C, if "light with the narrowest possible bandwidth" was guided to the surface of a holographic sensor, in most cases there would be no reflection (see also paragraph 5 of the Lowe Declaration). Thus, the rationale given to combine Lowe *et al.* and Stephens *et al.* is not valid, and such a combination (or modification of Lowe *et al.*), could, in fact, not have been made without the impermissible use of hindsight.

Moreover, the Appellants maintain that one of ordinary skill in the art, wishing to detect an analyte as with Lowe *et al.*, would not have looked to the teachings of Stephens *et al.* In particular, because Stephens *et al.* does not teach determining the presence of anything (let alone an analyte), the reference would not be considered when addressing the problem of providing an effective subcutaneous implant as with Lowe *et al.*

E. The Answer implies that Appellants' argument regarding Yin *et al.* would only be valid if additional features were recited in the claims.

The Answer states at page 14 that "the features upon which applicant relies (i.e., that a convex or concave mirror is reconstructed via the fringes) are not recited in the rejected claim(s)." However, the Appellants submit that the fact that these features are not recited in the claims is not relevant. Yin *et al.* disclose only that any image can be reconstructed in a non-planar film, and say nothing about the retro-reflecting properties of a hologram recorded using a concave or convex mirror (or a prism or a mirror recorded using one or more reflective beads). The claims do recite that "the non-planar mirror is concave, convex, capable of effecting retroreflection, recorded using one or more reflective beads, or a prism."

Moreover, the Appellants maintain that one of ordinary skill in the art would have had no reason to look to the Yin *et al.* reference because modifying the hologram substrate of Lowe *et al.* with the curvature of Yin *et al.* would merely lead to a sensor comprising a holographic recording of any object in a curved layer which would not have the retro-reflecting properties necessary for the present invention. That is, modifying the hologram substrate of the modified Lowe *et al.* reference with the curvature of Yin *et al.* would not give a hologram which is formed as a non-planar mirror, wherein the non-planar mirror is concave, convex, capable of effecting retroreflection, recorded using one or more reflective beads, or a prism.

In conclusion, the Appellants respectfully submit that the Examiner still has not established a *prima facie* case of obviousness with respect to claims 1-19.

In view of the foregoing and the Appeal Brief filed November 24, 2010, the Appellants urge the Board to reverse the outstanding rejections under 35 U.S.C. §103(a) and pass this application to issuance.

Respectfully submitted,

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